

REMARKS

Claims 1-16 are pending in the present application, and are rejected. Claim 10 is herein canceled. Claims 1, 3 and 8 are herein amended. No new matter has been presented.

Claim Rejections - 35 U.S.C. §103

Claims 1-7 and 14-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nishimura (US 5,495,105) in view of Martin (US 4,887,721) in further view of Mitsuhiro (JP-4370089).

Claims 11-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nishimura in view of Martin (in further view of Mitsuhiro).

As argued in the Response submitted on October 30, 2007, Applicants submit that neither Nishimura nor Mitsuhiro describes or suggests the features of the present invention, “the method and apparatus for recovering target fine particles while adjusting the laser beam so as to converge inside chambers of a collector facing a laser beam emitting aperture with the flow path interposing therebetween.”

The Examiner broadly construes that Mitsuhiro discloses a focused laser beam (7) converging inside a chamber (A) of a collector facing a laser beam emitting aperture (3b) with the flow path interposing there between (Fig. 1).

Applicants respectfully disagree with this rejection and submit that the Examiner has incorrectly characterized Mitsuhiro. In Mitsuhiro, the passage A along which the particles flow and in which the lasers are focused can not reasonably be considered a “chamber of a collector.”

That is, the passage A contains a flow path along which particles flow toward collector chambers. The passage itself is not a collector chamber, or even a chamber of a collector. The entire apparatus of Mitsuhiro is a separator, not a collector. The collector chambers are a subset of the separator of Mitsuhiro. Therefore, at best the passage A could be considered a chamber of a separator, not a chamber of a collector.

However, even if the passage A of Mitsuhiro could be reasonably considered a chamber of a collector, the passage A *contains* the flow path, which may be construed to be along the center of the passage A along the laser path. Therefore, since the passage A *contains* the flow path, the flow path could not interpose between the laser aperture and the chamber, since the flow path is *inside* the asserted chamber.

Therefore, Mitsuhiro provides no suggestion with respect to the limitation of a laser beam adjusted to converge inside a chamber of a collector, the chamber facing a laser beam emitting aperture with the flow path interposing therebetween.

With respect to Nishimura et al., Applicants further submit that the Examiner is failing to properly characterize the cited patent. The Examiner characterizes Nishimura et al. as “sorting and recovering fine particles”. Applicants respectfully disagree with this characterization.

Applicants note that Nishimura et al. teaches that a flow of liquid containing floating fine particles is formed in a flow path, and a laser is focused on the liquid flow, whereby the particle is optically trapped at the irradiating position, thus being stopped against the liquid flow or being slowed by a braking force. The cited patent teaches that the laser is utilized in controlling the spacing of the particles in the flow or in separating the particles.

Thus, the particles are indeed recovered in Nishimura et al., but the particles are not sorted. Rather, the laser arrangement in the cited patent merely ensures a proper spacing between the particles.

Further, the present claims require the selective deflection of the fine particles *in the direction of convergence* of the laser beam. Nishimura et al. includes three laser beams, two of which are parallel, and only one of which (49) has a convergent beam. The laser 49 having the convergent beam is focused to converge directly in the middle of the first segment 43 of the path. Thus, the limitation of “a laser beam adjusted to converge inside a chamber of a collector, the chamber facing a laser beam emitting aperture with the flow path interposing therebetween” is not taught or suggested by Nishimura et al., because it can not reasonably be said that the asserted flow path 43 is interposed between (1) a chamber in which the beam is focused and (2) the laser beam emitting aperture.

Therefore, Applicants submit that neither Nishimura nor Mitsuhiro describes or suggests the features of the present invention, in particular, “the method and apparatus for recovering target fine particles while adjusting the laser beam so as to converge inside chambers of a collector facing a laser beam emitting aperture with the flow path interposing therebetween.”

With respect to Martin, Applicants submit that the cited Martin does not describe that the laser beam is converged in chambers of the collector, thereby sorting and recovering fine particles in the chambers.

Applicants note that in the method and apparatus of Martin, the particle sorting is performed by intersecting two laser beams with each other at right angles as shown in FIGS. 1 and 2. More specifically, as shown in FIG. 2 and in column 2, line 68, to column 3, line 6, while guiding fine particles in a flow path with propulsion beam 12' (driving beam), deflection beam 12'' having a higher light intensity than the propulsion beam 12' is irradiated at a right angle to the propulsion beam 12' thereby deflecting the direction of the movement of fine particles for sorting and recovering in a collector.

At this point, as shown in FIG. 2 and column 4, lines 38 to 58, the beam waists of the propulsion beam 12' and deflection beam 12'' are, respectively, position 72, and position 76, both located within the flow path, not in a chamber of the collector.

Thus, Martin does not describe nor suggest the convergence of the laser beam inside a chamber of the collector.

Furthermore, in Martin, the particle sorting is performed by intersecting two beams, i.e., propulsion beam 12' and deflection beam 12'', at right angles and further locating both of the beam waists of these beams at certain positions (i.e., positions 72 and 76) within the flow path. According to this principle, the beam waist of the propulsion beam 12' is set at a single position (position 72) within the flow path. That is, the propulsion beam 12' cannot have more than two beam waists within the flow path. Consequently, this method works in a different way than that of the claimed invention, and therefore is not capable of recovering multiple kinds of particles moving in the flow path into multiple chambers (i.e., multiple recovery).

The proposed amendments limit the present invention to be a method of multiple recovery and an apparatus for recovery that uses at least two emitting apertures and at least two recovery chambers. As a result of the amendments, the present invention should be even more differentiated from that of Martin.

Therefore, Applicants submit that the amended present invention is not reached from the disclosures of Nishimura, Martin or Mitsuhiro, alone or in combination.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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